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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/512,134	10/13/2005	Uwe Guntow	62163(45107)	9190

21874 7590 07/24/2007  
EDWARDS ANGELL PALMER & DODGE LLP  
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BOSTON, MA 02205

EXAMINER
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LAIOS, MARIA J

ART UNIT	PAPER NUMBER
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1753

MAIL DATE	DELIVERY MODE
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07/24/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/512,134

Applicant(s)

GUNTOW ET AL.

Examiner

Maria J. Laios

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 October 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 October 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>See Continuation Sheet</u>                                    | 6) <input type="checkbox"/> Other: _____                          |

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :20/01/2005, 19/01/2005, 22/10/2004.

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The IDS of 22 October 2004 has been lined through, as it is a duplicate of the IDS of 20 January 2005.

### ***Drawings***

2. The drawings are objected to because there should not be a description next to the Figure numbers. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

## **INFORMATION ON HOW TO EFFECT DRAWING CHANGES**

### **Replacement Drawing Sheets**

Drawing changes must be made by presenting replacement sheets which incorporate the desired changes and which comply with 37 CFR 1.84. An explanation of the changes made must be

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presented either in the drawing amendments section, or remarks, section of the amendment paper. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). A replacement sheet must include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of the amended drawing(s) must not be labeled as "amended." If the changes to the drawing figure(s) are not accepted by the examiner, applicant will be notified of any required corrective action in the next Office action. No further drawing submission will be required, unless applicant is notified.

Identifying indicia, if provided, should include the title of the invention, inventor's name, and application number, or docket number (if any) if an application number has not been assigned to the application. If this information is provided, it must be placed on the front of each sheet and within the top margin.

### **Annotated Drawing Sheets**

A marked-up copy of any amended drawing figure, including annotations indicating the changes made, may be submitted or required by the examiner. The annotated drawing sheet(s) must be clearly labeled as "Annotated Sheet" and must be presented in the amendment or remarks section that explains the change(s) to the drawings.

### **Timing of Corrections**

Applicant is required to submit acceptable corrected drawings within the time period set in the Office action. See 37 CFR 1.85(a). Failure to take corrective action within the set period will result in ABANDONMENT of the application.

If corrected drawings are required in a Notice of Allowability (PTOL-37), the new drawings MUST be filed within the THREE MONTH shortened statutory period set for reply in the "Notice of Allowability." Extensions of time may NOT be obtained under the provisions of 37 CFR 1.136 for filing the corrected drawings after the mailing of a Notice of Allowability.

### ***Specification***

3. Applicant is reminded of the proper content of an abstract of the disclosure.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claim 9 recites the limitation "LSM coating solution and USLM coating solution" in lines 2 and 3 of claim 9. There is insufficient antecedent basis for this limitation in the claim.

*Claim Rejections - 35 USC § 102*

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-3 and 5-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Herbstritt et al. (Cathode Performance: Influence of MOD-Intermediate Layer and Electrolyte Surface Enlargement, *Proceedings of the Fourth European Solid Oxide Fuel Cell Conference*, 10<sup>th</sup> – 14<sup>th</sup> July 2000, Lucerne, Switzerland, 2000, pp. 697-706).

With regard to claims 1 and 10, Herbstritt et al. discloses a high temperature solid electrolyte fuel cell comprising an electrolyte between two electrode layers obtainable by a process comprising the steps of applying 8YSZ-layer (electrolyte particles) paste onto 8YSZ-green tape (unsintered electrolyte) by screen printing and sintering the thus produced structure (Page 699, lines 4-9) and depositing ULSM or LSC (electrode layer) (Page 699 line 12) by MOD method (Page 699 lines 23-24) then thermal treatment of the structure (page 699 line 20).

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With regard to claim 2, Herbstritt et al further discloses the electrolyte of claim 1 as 8YSZ (yttrium stabilized zirconium) (page 699 line 6).

With regard to claim 3, Herbstritt et al further discloses the paste of claim 1 as comprising of 8YSZ (yttrium stabilized zirconium) (page 699 line 6).

With regard to claim 5, Herbstritt et al. discloses the screen-printing a porous monolayer of individual YSZ particles of approximately 17  $\mu\text{m}$  onto the electrolyte substrate (Abstract).

With regard to claim 6, Herbstritt et al. discloses the electrolyte boundary layer/interface layer is applied by the MOD process (Abstract page 697 line 9-11).

With regard to claims 7 and 8, Herbstritt et al discloses the electrode layer of claim 1 as being either LSM (ULSM  $\text{La}_{0.75}\text{Sr}_{0.20}\text{MnO}_3$ ) or LSC ( $\text{La}_{0.50}\text{Sr}_{0.50}\text{CoO}_3$ ) (abstract page 697 line 14).

With regard to claim 9, Herbstritt et al. discloses the concentration of the coating solution is adjusted between 11 and 12 mass percent of the oxide content (solid content).

9. Claims 1-6, 8 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Herbstritt et al. (Increased Cathode Performance using a Structured Electrolyte Surface, *Electrochemical Society Proceedings*, Volume: 99-19, 1999, pp. 972-980, hereinafter Herbstritt 2).

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With regard to claims 1 and 10, Herbstritt 2, discloses a high temperature solid electrolyte fuel cell comprising an electrolyte layer between two electrode layers obtainable by a process comprising the steps of applying 8YSZ (electrolyte particles) in a screen printing paste onto an 8YSZ-green tape (unsintered electrolyte) and sintering to form a structure and in the next step depositing a thin micro porous layer of LSM (ULSM:  $\text{La}_{0.75}\text{Sr}_{0.20}\text{MnO}_3$ ) by MOD and followed a thermal treatment of structure (Page 973, Paragraph 3, 4 and page 974 line 13).

With regard to claim 2, Herbstritt 2 discloses the electrolyte an 8YSZ (yttrium doped zirconium oxide).

With regard to claim 3, Herbstritt 2 discloses the paste of claim 1 as 8YSZ (yttrium doped zirconium oxide).

With regard to claims 4 and 5, Herbstritt 2 further discloses the paste of claim 3 as having a solid content of 20, 14, or 11 weight percent with a particle size of  $17\mu\text{m}$  (Page 975, Table 1).

With regard to claim 6, Herbstritt 2 discloses that a well-defined, three-dimensional interface (boundary) realized by screen-printing a porous monolayer of 8YSZ particles onto the electrolyte substrate (Abstract).

With regard to claim 8, Herbstritt 2 discloses the layer as ULSM:  $\text{La}_{0.75}\text{Sr}_{0.20}\text{MnO}_3$  (Page 973, Paragraph 4).



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10. Claims 1-3, 6 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Ivers-Tiffée et al. ("Material and technologies for SOFC-Components, *Journal of the European Ceramic Society*, 2001, pp 1805-1811).

With regard to claims 1 and 10, Ivers-Tiffée et al. discloses a high temperature solid electrolyte fuel cell comprising an electrolyte layer between two electrode layers (Figure 12) obtainable by a process comprising the steps: applying electrolyte particles in a screen printing paste onto an unsintered electrolyte and sintering the thus produced structure and depositing a nanoporous electrode thin layer by MOD process on the structure and the thermal treatment of the thus coated structure (page 1809, col. 2 lines 20-25). Figure 12 discloses the layers of the electrolyte and anode and cathode and lines 20 -25 discloses the process upon which the cathode/electrolyte interface is improved.

With regard to claim 2, Ivers-Tiffée et al. further discloses the electrolyte as 8YSZ (yttrium stabilized zirconium) (page 1809, col. 2 line 21).

With regard to claim 3, Ivers-Tiffée et al. discloses possible electrolytes as 8YSZ (yttrium stabilized zirconium) (page 1809, col. 2 line 21) or Sc-doped  $ZrO_2$  and Gd doped  $CeO_2$  (Table 2, page 1807) and the electrolyte is screen printed (page 1806 col. 2 last paragraph).

With regard to claim 6, Ivers-Tiffée et al. discloses covering the increased surface area (electrolyte boundary layer) by an electrochemical active thin film via MOD (page 1809 lines 20-25).

### ***Claim Rejections - 35 USC § 103***

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Herbstritt et al.

(Cathode Performance: Influence of MOD-Intermediate Layer and Electrolyte Surface Enlargement,

*Proceedings of the Fourth European Solid Oxide Fuel Cell Conference*, 10<sup>th</sup> – 14<sup>th</sup> July 2000, Lucerne, Switzerland, 2000, pp. 697-706).

With regard to claim 4, Herbstritt et al. discloses that the 8YSZ particle content in the screen-printing paste was adjusted to get an effective electrolyte surface enlargement of 25 percent (Page 699). However, Herbstritt et al does not disclose that screen-printing paste has a solid content of 10-30 weight percent. Herbstritt et al. is clearly teaching that the content of electrolyte particle (which is a solid) is a results effective variable that that controls the effective electrolyte surface enlargement.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have 10-30 weight percent of 8YSZ particle in the screen printing paste because it has been held by the courts that optimization of a results effective variable is not novel. *In re Boesch*, 617 F2d 272, 205 USPQ 215 (CCPA 1980).

13. Claims 7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Herbstritt

et al. (Increased Cathode Performance using a Structured Electrolyte Surface, *Electrochemical Society*

*Proceedings*, Volume: 99-19, 1999, pp. 972-980, hereinafter Herbstritt 2) in view of Chen et al. (US 6,645,656 B1).

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With regard to claims 7 and 9, Herbstritt 2 discloses the structure of the solid electrolyte fuel cell, as applied in claim 1, and the concentration of the coating solution as 11 to 12 percent (Page 974 line 9) but fails to disclose the material as  $\text{La}_{0.5}\text{Sr}_{0.5}\text{CoO}_3$ . Chen et al. teaches a solid oxide fuel cell in which a thin film of  $\text{La}_{0.5}\text{Sr}_{0.5}\text{CoO}_{3-\delta}$  is applied by MOD on top of an YSZ layer (col. 5 lines 16-23 and col. 2 lines 28-31) and that LSM (ULSM  $\text{La}_{0.75}\text{Sr}_{0.2}\text{MnO}_3$ ), a widely used cathode material can also be used (col. 6 lines 28-30).

It would have been obvious to one of ordinary skill at the time of the invention to replace the  $\text{La}_{0.75}\text{Sr}_{0.2}\text{MnO}_3$  (LSM) of Herbstritt 2 with the  $\text{La}_{0.5}\text{Sr}_{0.5}\text{CoO}_{3-\delta}$  of Chen because LSM and  $\text{La}_{0.5}\text{Sr}_{0.5}\text{CoO}_{3-\delta}$  are art recognized equivalents and one would have a reasonable expectation of success in doing so.

### *Conclusion*

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maria J. Laios whose telephone number is 571-272-9808. The examiner can normally be reached on Monday - Thursday 9:30 am - 6:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MJL



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PRIMARY EXAMINER